



$$\begin{array}{c}
 \mathbf{Y} \\
 \text{Expression} \\
 \text{Matrix} \\
 \left[\begin{array}{c} \text{cells} \\ \text{genes} \end{array} \right]
 \end{array}
 =
 \begin{array}{c}
 \mathbf{X} \\
 \text{Perturbation} \\
 \text{Matrix} \\
 \left[\begin{array}{c} \text{cells} \\ \text{perturbations} \end{array} \right]
 \end{array}
 \begin{array}{c}
 \mathbf{\beta} \\
 \text{Coefficient} \\
 \text{Matrix} \\
 \left[\begin{array}{c} \text{genes} \\ \text{perturbations} \end{array} \right]
 \end{array}$$